

## ABSTRACT

# METHOD FOR COATING A METAL SURFACE WITH AN ULTRA-FINE LAYER

5                   The present invention relates to a method for continuously coating a substrate in motion such as a metal strip made of steel, the coating formed being an ultra-fine film of a thickness between 10 and 100nm, deposited on the substrate:

- 10    - from a solution containing nanoparticles of oxides,  
       - in conditions of controlled pH,  
       - said substrate being at a temperature higher than 120°C,  
       - the total duration of the deposition being less than 5  
       seconds and preferably less than 1 second,
- 15 characterised in that at least one chemical additive, called  
 a "refiner", is incorporated into said solution, said refiner  
 having, mutatis mutandis, the effect of restricting the  
 formation of said coating.

20 (Figure 1)

### Legend of the figures

**Fig.2a:** Treating solution

Overheated liquid, precipitation zone

Growing sphere of vapour

25 Metal

**Fig.2b:** Overheated solution, precipitation zone


Metal

**Fig.3:** Useful zone with refiners

Useful zone without refiners

30 Thickness (nm)

Temperature of the strip (°C)

Without refiners 

With refiners 